

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: NAKAYOSHI et al. Examiner: LAM, Cathy Fong Fong
Serial No.: 10/598,967 Confirmation No.: 2691
Filed: July 11, 2007 Group Art Unit: 1784
Docket No.: DC10031PCT/071051.00070
Title: METAL BASE CIRCUIT SUBSTRATE FOR AN OPTICAL DEVICE AND METHOD MANUFACTURING THE AFOREMENTIONED SUBSTRATE

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Subsequent to the filing of the Notice of Appeal with United States Patent and Trademark Office (USPTO) on September 10, 2010, the Applicants now submit a Brief on Appeal (Appeal Brief) in response to the rejections set forth in the Office Action dated May 10, 2010, and in furtherance of the Amendment filed on March 22, 2010. This Appeal Brief is being submitted in accordance with 37 CFR §41.37 and is accompanied by the required fee of \$540.00 under §41.20(b).

The USPTO is authorized to charge or refund any fee deficiency or excess to Deposit Account No. 08-2789.

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I. Real Party in Interest

The real party in interest is Dow Corning Toray Company, Ltd., to which an Assignment has been recorded at Reel 019582, Frame 0626 in the United States Patent and Trademark Office.

II. Related Appeals and Interferences

There are no known prior or pending appeals, interferences, or judicial proceedings which are related to, directly affect or are directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-5, 7 and 9-13 are pending in the application with claims 1 and 5 in independent form. Claims 6 and 8 were previously cancelled. No claims have been withdrawn.

Independent claims 1 and 5 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,116,472 to Wolter et al. (the ‘472 patent). The rejection of claims 1 and 5 over the ‘472 patent is being appealed.

IV. Status of Amendments

No amendments have been filed subsequent to the Amendment filed on March 22, 2010. All amendments have been entered and are reflected in the claims in the Claims Appendix.

V. Summary of Claimed Subject Matter

A. Independent claim 1

Independent claim 1 is directed toward a metal base circuit for an optical device. The metal base circuit substrate comprises a metal base substrate made from aluminum or aluminum alloy. The metal base substrate supports an electric circuit via an insulation layer. The insulation layer is formed from a transparent cross-linked silicone body having a light transmission of not less than 80%. In addition, the electric circuit is formed directly on the insulation layer.

Each element of independent claim 1 and support for each element in the specification is provided below in Table 1.

TABLE 1

Claim 1 elements	Support for the particular claim element in the specification
A metal base circuit substrate	Support for this claim element can be found in at least in the Abstract and paragraphs [0005], [0007], [0010] and [0024] of the specification of the subject application as originally filed.
for an optical device comprising	Support for this claim element can be found in the Abstract and at least paragraphs [0005], [0007] and [0024] of the specification of the subject application as originally filed.
a metal base substrate	Support for this claim element can be found in the Abstract and at least paragraphs [0005], [0011] and [0023] of the specification of the subject application as originally filed.

made from aluminum or aluminum alloy	Support for this claim element can be found in the Abstract and at least paragraphs [0005], [0011], [0032], [0035] and [0039] of the specification of the subject application as originally filed.
that supports an electric circuit	Support for this claim element can be found in the Abstract and at least paragraphs [0005] and [0015] of the specification of the subject application as originally filed.
via an insulation layer	Support for this claim element can be found in the Abstract and at least paragraphs [0005], [0012], [0013], [0015], [0032], [0035] and [0039] of the specification of the subject application as originally filed.
wherein said insulation layer is formed from a transparent cross-linked silicone body	Support for this claim element can be found in the Abstract and at least paragraphs [0005], [0012], [0013], [0025], [0028], [0032], [0035] and [0039] of the specification of the subject application as originally filed.
having a light transmission of not less than 80%,	Support for this claim element can be found in at least paragraph [0013] and Table 1 of the specification of the subject application as originally filed.
and said electric circuit is formed directly on said insulation layer.	Support for this claim element can be found in the Abstract and at least paragraphs [0005] and [0015] of the specification of the subject application as originally filed.

B. Independent claim 5

Independent claim 5 is directed toward a method of manufacturing a metal base circuit substrate for an optical device. The method comprises the step of applying a cross-linkable silicone onto the surface of a metal base substrate made from aluminum or aluminum alloy. The method further comprises the step of cross-linking the silicone,

thereby forming an insulation layer from a transparent cross-linked silicone body having a light transmission of not less than 80%. The method also comprises the step of forming an electric circuit directly on the insulation layer by either by (i) forming a conductive layer by electrolytic or non-electrolytic plating with subsequent etching, or (ii) printing with a conductive ink.

Each element of independent claim 5 and support for each element in the specification is provided below in Table 2.

TABLE 2

Claim 5 elements	Support for the element in the specification
A method of manufacturing a metal base circuit substrate	Support for this claim element can be found in the Abstract and at least paragraphs [0006] and [0017] of the specification of the subject application as originally filed.
for an optical device comprising the steps of:	Support for this claim element can be found in the Abstract and at least paragraphs [0006] and [0017] of the specification of the subject application as originally filed.
(a) applying a cross-linkable silicone	Support for this claim element can be found in the Abstract and at least paragraphs [0006], [0018], [0019], [0025], [0032], [0035] and [0039] of the specification of the subject application as originally filed.
onto the surface of a metal base substrate	Support for this claim element can be found in the Abstract and at least paragraphs [0006], [0018], [0032], [0035] and [0039] of the specification of the subject application as originally filed.
made from aluminum or aluminum alloy;	Support for this claim element can be found in the Abstract and at least paragraphs [0006], [0018], [0032], [0035] and [0039] of the specification of the subject application as originally filed.

(b) cross-linking said silicone,	Support for this claim element can be found in at least paragraphs [0006], [0019], [0027], [0032], [0035] and [0039] of the specification of the subject application as originally filed.
thereby forming an insulation layer	Support for this claim element can be found in at least paragraphs [0006], [0019], [0027], [0032], [0035] and [0039] of the specification of the subject application as originally filed.
from a transparent cross-linking silicone body	Support for this claim element can be found in at least paragraphs [0006], [0019], [0027], [0032], [0035] and [0039] of the specification of the subject application as originally filed.
having a light transmission of not less than 80%; and then	Support for this claim element can be found in at least paragraph [0013] and Table 1 of the specification of the subject application as originally filed.
(c) forming an electric circuit directly on said insulation layer either by	Support for this claim element can be found in the Abstract and at least paragraphs [0006] and [0020] of the specification of the subject application as originally filed.
(i) forming a conductive layer by electrolytic or non-electrolytic plating with subsequent etching, or	Support for this claim element can be found in at least paragraphs [0006], [0020], [0021], [0033] and [0040] of the specification of the subject application as originally filed.
(ii) by printing with a conductive ink.	Support for this claim element can be found in at least paragraphs [0006], [0020], [0022] and [0036] of the specification of the subject application as originally filed.

VI. Grounds of Rejection to be Reviewed on Appeal

Independent claims 1 and 5 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,116,472 to Wolter et al. (the ‘472 patent).

The rejection of claims 1 and 5 over the ‘472 patent is being appealed.

VII. Argument

Claims 1, 3-5, 7, 9-12 and 13 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,116,472 to Wolter et al. (the ‘472 patent).

In particular, the Examiner asserts that the ‘472 patent discloses a process of making a substrate for printed circuit boards. The Examiner contends that the substrate of the ‘472 patent is comprised of a metal layer and an electrically insulating material, and that a metallic conductor track is printed onto the insulating material. The Examiner further asserts that the metal layer is coated with a silicon compound, which is a crosslinkable organic silane compound that ranges from colorless to bright yellow. As such, the Examiner concludes and contends that “[w]ith the same materials and same method of making, it would inherently possess the same properties, in this case the light transmission percentage and the dielectric constant.” (Office Action dated May 10, 2010, page 3). Such an assertion of and reliance on inherency clearly indicates the ‘472 patent fails to expressly disclose, teach, or even suggest the transparency and the light transmission of the insulation layer expressly claimed in the subject application.

As the Examiner is aware, to properly establish anticipation under 35 U.S.C. §102, a reference must teach each and every element of a claim, either expressly or inherently (see MPEP 2131). The Examiner is also aware that “[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art.” MPEP 2143.03 (citing *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)). As described in greater detail below, the Examiner has failed to establish that each and every element of the claimed invention is present in the ‘472 patent, either expressly or inherently.

In particular, as set forth above, the Examiner asserts the instantly claimed elements relating to transparency and light transmission are inherent in the ‘472 patent. However, “[t]he fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic.” (emphasis added) MPEP § 2112 (citing *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993)). Moreover, “[t]o establish inherency, the extrinsic evidence ‘must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.’” (emphasis added) MPEP § 2112 (citing *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999)).

Not only is the Examiner relying on inherency in asserting that the silicones of the ‘472 patent are transparent, but the Examiner even relies on inherency in asserting that the silicones of the ‘472 patent have a light transmission of not less than 80%, as expressly claimed in the subject application. The Examiner has failed to provide any reasoning whatsoever to support a position that the instantly claimed transparency and light transmission are necessarily present in the ‘472. Moreover, the Examiner has not even shown that these claimed physical properties may result in the ‘472 patent, which still would not be enough to support a rejection based on inherency. “In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d

1461, 1464 (Bd. Pat. App. & Inter. 1990).

It is clear that the Examiner, in asserting “[w]ith the same materials and same method of making, [the insulating layer of the ‘472 patent] would inherently possess the same properties,” is assuming that all silicones possess the same physical properties because the chemistry of each respective silicone is not addressed. This assumption is incorrect. In fact, the ‘472 patent itself recognizes the different physical properties obtainable from silicones because the silicones of the ‘472 patent ranged from “colorless to bright-yellow.”” (see column 11, line 7 of the ‘472 patent). Not only did the physical properties obtained from the silicone of the ‘472 patent vary, but the ‘472 patent utilizes only one particular type of silicone chemistry, i.e., condensation-curable silicones. Even within this one subset of silicones, it is clear that silicones may have vastly different physical properties, let alone the broad spectrum of physical properties obtainable from other silicones, e.g. hydrosilylation-curable silicones, etc. Additional factors further influence physical properties of silicones, such as the various substituents, degree of cross-linking, etc. As such, the fact that the subject application and the ‘472 patent utilize a silicone in no way whatsoever means that the respective silicones inherently possess the same properties.

The Examiner has taken the position that “colorless” necessarily means transparent. In fact, on page 2 of the Advisory Action, the Examiner contends that the ‘472 patent “clearly discloses the crosslinkable silicone material could be a colorless material which the Examiner takes it as a material that can transmit 100% of the light.” Not only is this an incorrect interpretation of the term “colorless,” but even if the terms were used interchangeably, the Examiner still not set forth any reasoning to conclude that the

silicones of the ‘472 patent necessarily possess the instantly claimed light transmission.

As readily understood by one of skill in the art, “white” is the absence of color. As such, the term “colorless” generally refers to an object being white. As but one example, a plain piece of letterhead is colorless. Thus, according to the Examiner’s logic, because paper is “colorless,” paper must necessarily transmit 100% of light. Clearly, that is not the case. In fact, although paper is colorless, it is opaque. Similarly, the presence of a color does not necessarily mean an object is opaque. For example, stained glass windows have colors, yet are substantially transparent. As such, not only does the term “colorless” not mean “transparent,” but these two physical properties are mutually exclusive, i.e., an object can be opaque yet colorless, and an object can have a color yet be transparent.

Interestingly, based on the Examiner’s interpretation of the term colorless, the scale of the ‘472 patent, i.e., “colorless to bright-yellow,” relies two wholly different physical properties, i.e., transparency and color. Such a scale is unlikely because in order to be a proper continuum, the same physical property must be described on both ends of the continuum (which, incidentally, is the case because colorless means white, so the scale is from white to bright-yellow). As an extreme example illustrating the ridiculousness of a continuum utilizing two different physical properties, imagine a prior art reference disclosing an object having a Shore A hardness of 50 to a glass transition temperature of -50 °C.

Moreover, the ‘472 patent teaches in Column 8, lines 37-41 that its insulating coating may contain “usual additions such as, for example, fillers, for example mica, glass flakes and quartz particles, pigments leveling agents and the like.” As readily

understood by those of skill in the art, these “usual additions” decrease any light transmission of the insulating coating of the ‘472 patent, yet the insulating layer would still remain “colorless” with the inclusion of these “usual additions.”

Furthermore, the Applicants note that the failure of the ‘472 patent to disclose, teach, or even suggest an insulation layer which is transparent is not surprising in view of the fact the ‘472 patent also fails to disclose a metal base circuit substrate of an optical device or a method of manufacturing such a metal base circuit substrate of an optical device, as claimed in the subject application. The metal base circuit substrate claimed in the subject application reflects light and removes heat generated by operating the optical device via radiation. Conversely, the process disclosed by the ‘472 patent, which fails to even teach transparency of an insulation layer, would not be suitable for optical devices due to the inability of the insulation layer to remove heat and reflect light.

For the reasons set forth above, the Applicants respectfully submit that the ‘472 fails to disclose, teach, or even suggest, either expressly or even inherently (as improperly presented by the Examiner), an electrical insulation layer comprising a transparent cross-linked silicone body, as specifically claimed in the subject application. As such, the Examiner’s rejection under 35 U.S.C. § 102(b) is respectfully traversed. While the Applicants appreciate the Examiner has independently rejected the dependent claims of the subject application, those rejections are not specifically addressed herein.

In view of the foregoing, the Applicants respectfully submit that claim 1 is both novel and non-obvious over the prior art including over the ‘472 patent. As such, the Applicants submit that the claims are in condition for allowance and respectfully request such allowance. While it is believed that no additional fees are presently due, the

Commissioner is authorized to charge the Deposit Account No. 08-2789, in the name of Howard & Howard Attorneys PLLC for any fees or credit the account for any overpayment.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS PLLC

November 10, 2010
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VIII. Claims Appendix

1. (Previously Presented) A metal base circuit substrate for an optical device comprising a metal base substrate made from aluminum or aluminum alloy that supports an electric circuit via an insulation layer, wherein said insulation layer is formed from a transparent cross-linked silicone body having a light transmission of not less than 80%, and said electric circuit is formed directly on said insulation layer.
2. (Original) The metal base circuit substrate for an optical device according to Claim 1, wherein said insulation layer has a thickness not exceeding 10 µm.
3. (Original) The metal base circuit substrate for an optical device according to Claim 1, wherein a dielectric constant of said cross-linked silicone body does not exceed 4.0.
4. (Original) The metal base circuit substrate for an optical device according to Claim 1, wherein said circuit is formed either by etching a conductive layer formed in said insulation layer by electrolytic or non-electrolytic plating, or by printing said circuit on said insulation layer with the use of an electroconductive ink.
5. (Previously Presented) A method of manufacturing a metal base circuit substrate for an optical device comprising the steps:
 - a) applying a cross-linkable silicone onto the surface of a metal base substrate made from aluminum or aluminum alloy;

b) cross-linking said silicone, thereby forming an insulation layer from a transparent cross-linked silicone body having a light transmission of not less than 80%; and then

c) forming an electric circuit directly on said insulation layer either by (i) forming a conductive layer by electrolytic or non-electrolytic plating with subsequent etching, or (ii) by printing with a conductive ink.

6. (Canceled)

7. (Previously Presented) The metal base circuit substrate for an optical device according to Claim 1, wherein said insulation layer has a light transmission of not less than 90%.

8. (Canceled)

9. (Previously Presented) The method of manufacturing a metal base circuit substrate for an optical device according to Claim 5, wherein the insulation layer has a light transmission of not less than 90%.

10. (Previously Presented) The metal base circuit substrate for an optical device according to Claim 1, wherein said insulation layer has a pencil hardness of not less than 2H.

11. (Previously Presented) The method of manufacturing a metal base circuit substrate for an optical device according to Claim 5, wherein said insulation layer has a pencil hardness of not less than 2H.

12. (Previously Presented) The metal base circuit substrate for an optical device according to Claim 1, wherein said insulation layer has a dielectric constant of not more than 4.

13. (Previously Presented) The method of manufacturing a metal base circuit substrate for an optical device according to Claim 5, wherein said insulation layer has a dielectric constant of not more than 4.

IX. Evidence Appendix

None.

X. Related Proceedings Index

None.